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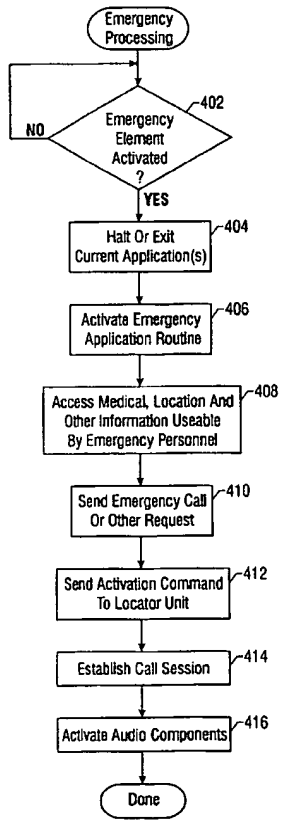
(54) Title: SENDING AN EMERGENCY INDICATION OVER A PACKET-BASED NETWORK



(57) Abstract: An emergency notification system (10) includes various terminals having emergency activation elements that when activated by a user sends an emergency notification over a packet-based data network to a central system, such as an emergency dispatch center (112). Upon activation of the emergency activation element, an emergency call is placed. Associated with the emergency call is the issuance of a message to enable identification of the location of the system so that the emergency dispatch center (112) can determine the location of the source of the emergency call. Upon receiving the activation request, a locator unit (104) communicates location information to the emergency dispatch center (112). As a result, a dispatcher at the emergency dispatch center (112) is notified of the emergency call and the location of the source of the emergency call so that the dispatcher is able to send emergency personnel to respond to the emergency call.

WO 02/33897 A2

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Sending An Emergency Indication Over A Packet-Based Network

Technical Field

The invention relates to communicating emergency indications.

Background

With the proliferation of computer networks, such as local area networks (LANs), wide area networks (WANs), the Internet, and other networks, it has become convenient for users of computing devices or systems to communicate with each other and to access various sources of information. Examples of such computing devices or systems include desktop computers, personal computers, personal digital assistants (PDAs), and the like. Popular forms of communications across such networks include electronic mail, web browsing, file transfers, and other communications. Voice and other forms of real-time interactive or streaming communications are also becoming common over such networks.

A network protocol that is commonly used to enable communications between end points is the Internet Protocol (IP), which is a connectionless, packet-based protocol. In an IP data network, each data packet is routed to a node having a destination IP address contained within the header of the packet. Data packets may be routed over separate network paths before arriving at the final destination for reassembly. Aside from IP networks, other types of packet-based networks also exist.

Although communications over packet-based networks are replacing or supplementing telephone calls over the public switched telephone network (PSTN), a convenient mechanism has not been provided to enable emergency calls with devices or systems coupled to packet-based networks. Using a telephony device coupled to the PSTN, a user can dial an emergency number, such as a 911 call, which places a call to an emergency dispatch center. Enhanced 911 (E911) regulatory requirements require that location information concerning where the 911 caller is located be sent with the emergency call. In the PSTN, the telephone number of the caller is communicated to a public safety answering point (PSAP), where the telephone number is cross-referenced with an address database to determine the location of the caller. The information is then displayed to the emergency dispatcher to direct public safety personnel responding to the emergency call. This capability of locating a device or system is typically not available in many packet-based networks.

In addition, devices or systems such as a computer, PDA, or other like device, do not have user interfaces that lend themselves to quick emergency calls. Usually, establishing communications over a data network requires the launching of an appropriate application software, which may be relatively time consuming and thus unacceptably slow, particularly in an emergency situation. Further, the device or system may have other active applications that may further slow down operation of the device or system.

Summary

In general, according to one embodiment, a system capable of communicating over a packet-based network comprises an emergency activation element and a controller responsive to activation of the emergency activation element to send an emergency indication over the packet-based network to a predetermined entity.

Some embodiments of the invention may have one or more of the following advantages. A convenient mechanism is provided to issue emergency calls from systems or devices coupled to packet-based networks. Users have enhanced flexibility in placing emergency calls from a wide variety of devices or systems, not just from traditional circuit-switched telephony devices. A convenient user interface is provided to facilitate the placement of emergency calls from such devices.

Other features and advantages will become apparent from the following description, from the drawings, and from the claims.

Brief Description Of The Drawings

Fig. 1 is a block diagram of an embodiment of a communications system in which various types of systems or devices are coupled to a packet-based data network.

Fig. 2 is a block diagram of an embodiment of a system to enable identification of the location of a device or system from which an emergency call is issued.

Fig. 3 illustrates a system including emergency activation elements in accordance with some embodiments.

Fig. 4 is a block diagram of a wireless device including emergency activation elements according to other embodiments.

Fig. 5 is a flow diagram of a process performed by the system of Fig. 3 or Fig. 4 for processing activation of an emergency call.

Fig. 6 is a block diagram of a locator unit for use in the system of Fig. 2, in accordance with an embodiment.

Fig. 7 is a flow diagram of a process performed by the locator unit of Fig. 6.

Fig. 8 is a flow diagram of a process performed by a central authority system in an emergency dispatch center.

Detailed Description

In the following description, numerous details are set forth to provide an understanding of the present invention. However, it will be understood by those skilled in the art that the present invention may be practiced without these details and that numerous variations or modifications from the described embodiments may be possible.

Referring to Fig. 1, a communications system 10, according to one example, includes a data network 12 coupled to various network elements. In the illustrated example, a community 14 (e.g., an organization, government agency, business enterprise, etc.) includes various terminals that are capable of communicating with the data network 12 through a router 17. The community 14 includes a local area network (LAN) 20 that is connected to computers 22 and 24 and a network telephone 18. A network server 16 is also connected to the LAN 20.

Another computer 37 can communicate over the data network 12 through a router 38. In addition, a computer 32 at a remote location has access to a public switched telephone network (PSTN) 26. The computer 32 can establish a dial-up connection with the network server 16 (through a modem 19 in the network server 16) or establish a session over the data network 12 through a service provider system 28, such as a system associated with an Internet service provider (ISP).

Wireless access of the data network 12 is also possible through a wireless infrastructure system 40, which in one embodiment includes a base station system (BSS) 46, a serving GPRS support node (SGSN) 44, and a gateway GPRS support node (GGSN) 42. The GPRS (General Packet Radio Service) protocol provides for packet-based data services through a wireless infrastructure. Other protocols for defining packet-based services include the Enhanced GPRS (EGPRS) protocol and the EGPRS COMPACT protocol, which are set by the European Telecommunications Standards Institute (ETSI).

In the illustrated embodiment, wireless personal digital assistants (PDAs) 50 are capable of communicating over radio frequency (RF) links 48 with the BSS 46. Packet data can be exchanged between the PDA 50 and the data network 12 through the wireless infrastructure system 40.

One example of the data network 12 is an Internet Protocol (IP) network, which is a connectionless, packet-based network. IP is described in Request for Comments (RFC) 791, entitled "Internet Protocol," dated September 1981. Another version of IP is described in RFC 2460, entitled "Internet Protocol, Version 6 (IPv6) Specification" dated December 1998. Packet-based networks communicate with packets, datagrams or other units of data over the networks. Packets or other units of data injected into a packet-based data network may travel independently over any network (and possibly over different networks) to a destination point, with routing based on addresses carried in the packets. The packets, which may arrive out of order, are reassembled by the destination terminal.

Other types of packet-based data networks 12 include Asynchronous Transfer Mode (ATM) or Frame Relay networks, which are connection-oriented packet-based networks. In a connection-oriented packet-based network, a virtual circuit or connection is established between two end points so that packets are received in the same order in which they were transmitted.

Examples of types of communications that may be performed between the various network elements over the data network 12 include electronic mail messaging, text chat sessions, web browsing, file transfers, and so forth. In addition, voice and other forms of real-time interactive or streaming communications may be performed between network elements. For example, the network telephone 18 can establish a call session over the data network 12 with another network element that has voice processing capabilities.

In accordance with some embodiments of the invention, emergency calls may also be issued by many of the network elements shown in Fig. 1. As used here, an "emergency call" is any type of notification of an emergency condition sent at least in part over the data network 12 to some entity that processes and responds to the emergency call. The call need not be a telephony call, but instead can be any type of communications that can carry one or more messages to convey the emergency notification.

The computers 22 and 24 include emergency activation elements 23 and 25, respectively, which when activated by a user causes an emergency call to be issued over the

data network 12 to an emergency dispatch center 112 (Fig. 2). In one example embodiment, the computer 22 includes a key 23 on its keyboard (or other part of the housing of the computer 22) that when depressed by the user causes transmission of an emergency call. The computer 24, as another example, has a graphical activation element 25 (such as an icon) that is displayed in a screen 27. Using an input device, such as a mouse or cursor control keys, the user can select the emergency activation element 25 to cause an emergency call to be placed.

Similarly, the computer 32 includes an emergency activation button 34, the computer 37 includes an emergency activation button 36, and the PDA 50 includes an emergency activation button 51. The emergency activation buttons may have a distinct color (e.g., red) or shape to enable easy identification by a user. Also, any of the terminals referenced above may have more than one button. As an alternative, voice recognition may be performed to perform an emergency call. In this example, the emergency activation element is the detector for recognizing words such as "EMERGENCY," "HELP," or "911," in conjunction with a code word to avoid inadvertent emergency calls.

Use of the emergency activation elements provides for a convenient and efficient mechanism to issue emergency notifications to the emergency dispatch center 112. Thus, instead of having to run to a telephone and dialing 911, for example, to place an emergency call, a user can activate the emergency activation element on the workstation at which the user is located. This provides a quicker way of sending the emergency calls to enhance quicker response times by emergency personnel to an emergency condition.

In addition to providing a convenient mechanism for issuing emergency calls, some embodiments of the invention also provide a reliable mechanism to locate the source of the emergency call. Referring to Fig. 2, a system 100, according to one embodiment, is able to locate a terminal that issued an emergency call. The system 100 includes a number of locator units 104 that are capable of communicating with satellites 102, which may be global positioning system (GPS) satellites to provide GPS data relating to positional information. In one embodiment, each locator unit 104 includes a GPS receiver to make measurements of signals from four satellites to solve for the three-dimensional coordinates of the locator unit 104 and the clock offset between a clock in the GPS receiver and the GPS system time. Instead of using GPS positioning data, other mechanisms for performing location identification may be used. The locator units 104 are dispersed throughout a region In a

region in which there is a relatively high density of terminals capable of issuing emergency calls, the number of locator units 104 can be increased to allow more accurate identification of the location of a terminal.

Depending on which terminal issued an emergency call, one of the locator units 104 is activated to provide location information associated with the terminal. The location information is communicated to the emergency dispatch center 112 to enable emergency dispatchers to determine where to send emergency personnel to aid the person who issued the emergency call. The locator units 104 send location information over a communications medium 106, which may be an RF medium, microwave medium, wired medium, and so forth.

Data transmitted by the locator units 104 over the communications medium 106 are received by a locator server 108, which is coupled to the data network 12. The emergency dispatch center 112 includes a network server 114 that is coupled to the data network 12, and a central authority system 116 that is connected to the network server 114. The locator server 108 packages the location information received from the locator units 104 into a format that is communicated to the network server 114 over the data network 12. The central authority system 116 receives emergency calls and information identifying sources of the emergency calls though the network server 114.

The locator units 104 are activated by activators 110, which send activation requests to appropriate ones of the locator units 104 in response to receipt of emergency calls. In one embodiment, an activator 110 sends an activation request to a locator unit 104 that is in the general vicinity of the terminal that originated the emergency call. The activators 110 can be incorporated into the terminals shown in Fig. 1, or alternatively, they may be external devices that monitor for emergency calls issued by the terminals of Fig. 1. When a locator unit 104 receives an activation request from an activator 110, the locator unit sends location information to the locator server 108, which forwards the information to the central dispatch center 112.

Instead of using locator units 104, other techniques for identifying locations of terminals that issue emergency calls may be employed. For example, the locator mechanism can be incorporated into routers or other devices coupled to various networks. Such devices may detect the occurrence of an emergency call, and in response to such detection, may send a special code or location information to the emergency dispatch center 112.

Referring to Fig. 3, example elements of a typical computer 200 (or other type of user terminal) are illustrated. Examples of other types of user terminals include Internet appliances, set-top boxes, and so forth. The computer 200 may be any one of the computers 22, 24, 32, or 37 (Fig. 1). The computer 200 includes a keyboard 230 that has an emergency activation button 202, which when selected by the user causes an emergency call to be issued from the computer 200. An input/output (I/O) interface 215 is coupled to the keyboard 230 to receive indications that keys have been activated, including the emergency call button. In another embodiment, the emergency key button 202 may be positioned in another portion of the computer 200, such as on a mouse, the housing of a monitor, the main housing of the computer 200, and any other portion accessible by a user.

The computer 200 also includes a control unit or processor 210 and a storage unit 212. Various software application routines 216 are executable on the control unit 210. In addition, an emergency application routine 218 is also executable on the control unit 210. The emergency application routine 218 detects activation of the emergency activation button 202 (based on a signal, such as an interrupt, from the I/O interface 215), and in response, causes generation of an emergency call over the data network 12 through a network interface 228.

In another embodiment, the software emergency application routine 218 can be substituted with a hardware component, such as a chip, e.g., a programmable gate array (PGA), an application-specific integrated circuit (ASIC), a microcontroller, and so forth. Activation of an emergency activation element causes an indication (in the form of an interrupt or other signal) to be sent to the chip, which responds by performing some or all of the tasks of the emergency application routine 218 to place an emergency call. One benefit of using a hardware component is improved processing speed over a software routine, especially if multiple software applications are active together and using up system resources.

Instead of the emergency activation button 202, the computer 200 can alternatively (or in addition to) include an emergency activation element 204 that is displayable in a screen 208 of a display 206. For example, the emergency activation element 204 can be an icon or any element displayable as part of another application. Display of the emergency activation button 204 is controlled by a graphical user interface (GUI) routine 205. Activation of the emergency activation element 204 (such as by moving a cursor over the displayed emergency activation element and clicking a predetermined button) is received by the GUI routine 205, which communicates the activation to the emergency application routine 218.

In another alternative embodiment, the computer system 200 includes a voice detector that is able to recognize words such as "EMERGENCY," "HELP," or "911." The voice detector includes a microphone 219 coupled to the I/O interface 215. Voice data is communicated to the emergency application 218, which performs voice recognition.

To prevent inadvertent activation of an emergency call, a time-out period may be provided after activation of an emergency activation element has been received to provide a user an opportunity to cancel the emergency call. Alternatively, to activate the emergency call, the emergency activation element may have to be depressed for some predetermined period of time.

An emergency call may be issued by the computer 200 in one of various formats. For example, the emergency call can be communicated in a Hypertext Transport Protocol (HTTP) request, which is generated by an HTTP service 220 in response to emergency call initiation by the emergency application routine 218. Alternatively, the emergency call can be communicated in a call session established between the computer 200 and the emergency dispatch center 112 over the data network 12. The call session may be established using control messages according to the Session Initiation Protocol (SIP). A SIP stack 222 generates SIP messages, including the SIP Invite message, for transmission over the data network 12. The SIP stack 22 also parses SIP messages received from the data network 12. A version of SIP is described in RFC 2543, entitled "SIP: Session Initiation Protocol," dated in 1999.

Another protocol that defines messages for establishing call sessions over packet-based networks is H.323 Recommendation, established by the International Telecommunication Union (ITU). If H.323 or another protocol is used, then a module other than the SIP stack 222 is used. Once a call session is established over the data network, the emergency application routine 218 can communicate audio data to the emergency dispatch center 112. The audio data may be a prerecorded message indicating an emergency situation exists.

Optionally, a speaker (not shown) and the microphone 219 of the computer 200 may be activated to enable the user to speak to a dispatcher at the emergency dispatch center 112. After activation of the emergency activation element, the emergency call is sent, and a call session may be established with the emergency dispatch center 112 as noted above.

Messages are communicated between the HTTP service 220 or SIP stack 222 and the network interface 228 through a transport layer 224 (e.g., a User Datagram Protocol layer) and a network layer 226 (e.g., an IP layer). The User Datagram Protocol is described in RFC 768, entitled "User Datagram Protocol," dated August 1980, and provides a transport layer for managing connections between network elements over an IP network.

In the illustrated embodiment, the computer 200 also includes a wireless interface 214, which is coupled to an antenna 217. The wireless interface 214 and antenna 217 may be used to communicate activation requests originated by the emergency application routine 218 to one or more locator units 104 (Fig. 2). In this arrangement, the activator 110 of Fig. 2 includes the wireless interface 214 and the antenna 217.

Referring to Fig. 4, a wireless device 300 that can be used for issuing emergency calls is illustrated. For example, the wireless device 300 can be the PDA 50 in Fig. 1. The wireless device 300 includes a transceiver 318 to communicate wireless signals over an antenna 319. Wireless protocol stacks 316 enable communications of signaling between the transceiver 318 and a service 314 that defines packet communications to or from the wireless device 300. For example, the service 314 can be according to the Wireless Application Protocol (WAP) framework provided by the Wireless Application Protocol Forum, Ltd., and described in the Wireless Application Protocol Architecture Specification, dated April 30, 1998.

The wireless device 300 also includes an emergency application routine 308 and other application routines 306. An emergency application element 304 can be presented in a display 302 of the wireless device 300. Activation of the emergency element 304 is received by a GUI routine 305, which communicates the activation to the emergency routine 308. The various application routines are executable on a control unit or processor 310, which is connected to a storage unit 314.

In addition to, or in place of, the displayable emergency activation element 304, the wireless device 300 includes an emergency button 320 located on the housing of the wireless device 300. Activation of the emergency button 320 is received by an interface circuit 322, which is communicated to the emergency application 308.

The transceiver 318 and antenna 319 can also be used to communicate activation requests to the locator units 104 (Fig. 2). In this arrangement, the activator 110 of Fig. 2 includes the transceiver 318 and the antenna 319.

Referring to Fig. 5, acts performed in a system, e.g., computer 200 (Fig. 3) or device 300 (Fig. 4) for emergency processing are illustrated. The system determines if an emergency element has been activated (at 402). If so, active application routines may be halted or exited (at 404). Halting or exiting of active application routines may be performed to dedicate the resources of the system to placing an emergency call. This is to prevent other active application routines from interfering with or delaying the emergency call.

Next, the emergency application routine 218 (Fig. 3) or 308 (Fig. 4) is activated (at 406). The emergency application routine may be run as a background service that takes control of the system only upon detection that the emergency element has been activated.

Optionally, other information such as medical or location information are also accessed (at 408) for communication to the emergency dispatch center 112. For example, medical information (such as the health condition associated with the person using the computer) may be communicated to the emergency dispatch center 112 so that the emergency dispatcher can communicate any health problems to emergency personnel. Other personal information of the user may also be transmitted. If so configured, the system may also store a code to indicate the location of the system. This may be feasible with desktop computers or other systems or devices that stay relatively stationary. Next, an emergency call is sent (at 410) by the emergency application routine. Also, the emergency application routine can cause an activation command to be sent (at 412) to a corresponding locator unit 104 (Fig. 2).

To protect the medical information or other personal information that may be communicated over an unsecured network, cryptography may be employed to protect sensitive information. Many types of cryptographic algorithms exists, including key-exchange algorithms, algorithms that use one-way hash functions, and public-key algorithms (also referred to as asymmetric algorithms). Public-key algorithms are designed so that the key used for encryption is different from the key used for decryption. With public-key algorithms, keys used for decryption may be kept in an escrow system (maintained by a trusted third party). Thus, before sensitive information is transmitted, the information is encrypted to prevent interception of the sensitive information. At the receiving end (such as at the emergency dispatch center 112), the encrypted information is decrypted.

If enabled for voice sessions, the system may also establish (at 414) a call session with the emergency dispatch center 112. This may be accomplished by using SIP, H.323, or

other messaging. Audio components, such as a speaker, microphone, or headset, are activated (at 416) to enable voice communications by the user.

Referring to Fig. 6, the locator unit 104 includes a control unit 502 and a storage unit 504. A location identifier routine 505 is executable on the control unit 502 to determine the location of the locator unit 104 based on GPS data received from a GPS receiver 508. A GPS receiver is capable of receiving data from satellites 102 (Fig. 2). Alternatively, instead of basing the location of the locator unit 104 on GPS data, location information 506 identifying the location of the locator unit 104 may be stored in the storage unit 504, with the location information 506 communicated each time an activation command is received. Using location information 506 instead of GPS data works well with locator units 104 that are fixed in position. However, with locator units 104 that are capable of moving around, location determination based on GPS data provides more accurate location information.

In yet another arrangement, a location code may be communicated with an activation request 509 received from an activator 110 (Fig. 2). The location code provides the location of the terminal that originated the emergency call, which may provide for more accurate location identification.

A transmitter 510 in the locator unit 104 transmits location information over the communications medium 106 (Fig. 2) in response to receipt of an activation command 511 from an activation reception unit 512. The activation reception unit 512 decodes the activation request 509 to determine whether activation has been requested.

Referring to Fig. 7, a process performed by the locator unit 104 is illustrated. The locator unit 104 first detects (at 602) if an activation request 509 has been received. If so, the activation command is decoded (at 604). Next, the locator unit 104 determines (at 606) the location identifier based on received GPS data, the location information 306, or a code in the activation request 509.

After the location identifier has been determined, a locator message is prepared (at 608) to carry the location identifier. Next, the locator message is transmitted (at 610) over the communications medium 106 (Fig. 2) for communication to the emergency dispatch center 112 through the locator server 108, and data network 12.

Referring to Fig. 8, a process performed by the central authority system 116 is illustrated. The central authority system 116 determines (at 702) if an emergency call has been received. If so, the associated locator message is identified (at 704). Associating a

locator message with an emergency call message may be performed by the client terminal assigning a unique identifier for each call. The unique identifier can then be embedded in the locator message and emergency call message. Next, the emergency call and the associated location are presented (at 706) to a dispatcher at the central authority system 116, along with any supplemental information such as medical information.

The various software routines or modules discussed herein may be executable on control units in corresponding terminals. Instructions of such software routines or modules may be stored on one or more storage units. A control unit may include a microprocessor, a microcontroller, a processor card (including one or more microprocessors or microcontrollers), or other control or computing devices. As used here, a "controller" refers to hardware, software, or a combination thereof.

The storage units may include one or more machine-readable storage media for storing data and instructions. The storage media may include different forms of memory including semiconductor memory devices such as dynamic or static random access memories (DRAMs or SRAMs), erasable and programmable read-only memories (EPROMs), electrically erasable and programmable read-only memories (EEPROMs), and flash memories; magnetic disks such as fixed, floppy and removable disks; other magnetic media including tape; and optical media such as compact disks (CDs) or digital video disks (DVDs). Instructions that make up the various software routines or programs in various terminals and stored in respective storage units when executed by a respective control unit cause the corresponding terminal to perform programmed acts.

The instructions of the software routines or modules may be loaded or transported into the terminal in one of many different ways. For example, code segments including instructions stored on floppy disks, CD or DVD media, a hard disk, or transported through a network interface card, modem, or other interface device may be loaded into the system and executed as corresponding software layers, routines, or modules. In the loading or transport process, data signals that are embodied in carrier waves (transmitted over telephone lines, network lines, wireless links, cables, and the like) may communicate the code segments, including instructions, to the terminal. Such carrier waves may be in the form of electrical, optical, acoustical, electromagnetic, or other types of signals.

While the invention has been disclosed with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variations

therefrom. It is intended that the appended claims cover such modifications and variations as fall within the true spirit and scope of the invention.

What is claimed is:

1. A system capable of communicating over a packet-based network, comprising:

an emergency activation element; and

a controller responsive to activation of the emergency activation element to send an emergency indication over the packet-based network to a predetermined entity.

2. The system of claim 1, wherein the emergency activation element comprises a button.

3. The system of claim 1, wherein the emergency activation element comprises one or more buttons.

4. The system of claim 1, further comprising a display, wherein the emergency activation element comprises a graphical element presented in the display.

5. The system of claim 1, wherein the emergency activation element comprises a voice detector.

6. The system of claim 1, wherein the controller is adapted to send an activation request to enable a location mechanism to send information relating to a general location of the system.

7. The system of claim 1, wherein the controller is adapted to prepare the emergency indication in packet format for communication over the packet-based network.

8. The system of claim 1, wherein the controller is adapted to prepare a Hypertext Transport Protocol message to carry the emergency indication.

9. The system of claim 1, wherein the controller is adapted to establish a call session with the predetermined entity to enable communication of the emergency indication.

10. The system of claim 9, wherein the controller is adapted to establish the call session with Session Initiation Protocol messages.

11. The system of claim 9, wherein the controller is adapted to establish the call session with H.323 messages.

12. The system of claim 1, further comprising a storage element containing medical information, the controller adapted to communicate the medical information in addition to the emergency indication.

13. The system of claim 12, wherein the controller is adapted to further encrypt the medical information.

14. The system of claim 1, further comprising a storage element containing location information, the controller adapted to communicate the location information in addition to the emergency indication.

15. The system of claim 1, further comprising a keyboard, the emergency activation element located on the keyboard.

16. The system of claim 1, further comprising an input device, the emergency activation element located on the input device.

17. The system of claim 1, further comprising a housing, the emergency activation element located on the housing.

18. The system of claim 1, wherein the controller comprises software.

19. The system of claim 1, wherein the controller comprises a chip.

20. The system of claim 19, wherein the chip is selected from the group consisting of a programmable gate array, an application-specific integrated circuit, and a microcontroller.

21. A device capable of communicating with a locator unit and with an emergency system, comprising:

one or more interfaces corresponding to one or more communications media coupled to the locator unit and the emergency system;

an emergency activation element; and

a controller responsive to activation of the emergency activation element to send an emergency message to the emergency system and an activation request to the locator unit to enable identification of the location of the device.

22. The device of claim 21, wherein the one or more interfaces comprise a first interface to a packet-based network coupled to the emergency system.

23. The device of claim 21, wherein the one or more interfaces comprise a second interface to a wireless link coupled to the locator unit.

24. The device of claim 21, wherein the emergency activation element comprises a button.

25. The device of claim 21, wherein the emergency activation element comprises a keyboard key.

26. The device of claim 21, further comprising a display, the emergency activation element presented in the display.

27. The device of claim 21, wherein the emergency activation element comprises a voice detector.

28. A product comprising at least one storage medium containing instructions that when executed cause a system to execute a method comprising:

receiving activation of an emergency activation element; and

sending an emergency call over a packet-based network to an emergency entity in response to activation of the emergency activation element.

29. The product of claim 28, wherein the method further comprises establishing a call session over the packet-based network in response to activation of the emergency activation element.

30. The product of claim 28, wherein the method further comprises receiving an indication of activation of an emergency button.

31. The product of claim 28, wherein the method further comprises sending an activation request to activate a location mechanism to identify a general location of the system.

32. The product of claim 28, wherein the method further comprises sending a message to enable identification of a location of the system.

33. A method providing an emergency notification from a device coupled to a packet-based network, comprising:

receiving activation of an emergency activation element; and

sending an emergency call over the packet-based network to an emergency entity in response to activation of the emergency activation element.

34. The method of claim 33, further comprising sending a request to activate a location mechanism to identify a location of the device.

35. The method of claim 33, further comprising sending location information of the device.

36. The method of claim 33, wherein receiving activation of the emergency activation element comprises receiving activation of an emergency button on the device.

37. A system comprising:

an emergency activation element;

a network interface adapted for communication over a packet-based network;

a controller adapted to receive an indication of activation of the emergency activation element, the controller adapted to further generate an emergency notification through the network interface and over the packet-based network to an emergency processing center.

38. The system of claim 37, wherein the emergency activation element comprises one or more of the following: a button; a displayable element; and a voice detector.

39. The system of claim 37, wherein the controller comprises a processor and an emergency processing routine executable on the processor.

40. The system of claim 37, further comprising a processor, wherein the controller comprises a chip separate from the processor.

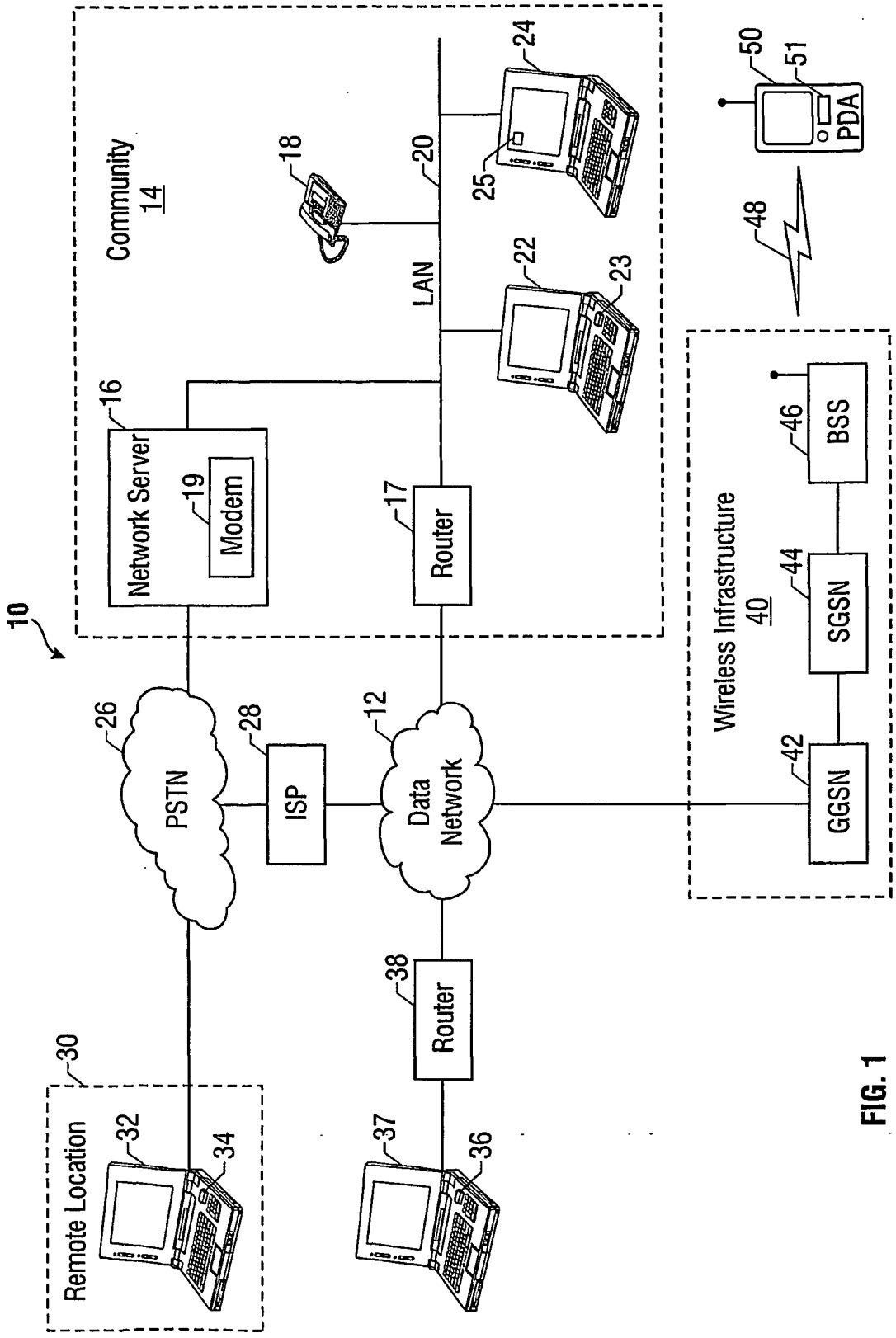
10
Community
14
Network Server
16
19
Modem
17
Router
18
20
LAN
22
23
24
25
50
51
PDA
48
Wireless Infrastructure
40
46
BSS
44
SGSN
42
GGSN
26
PSTN
28
ISP
12
Data Network
38
Router
30
Remote Location
32
34
37
36

FIG. 1

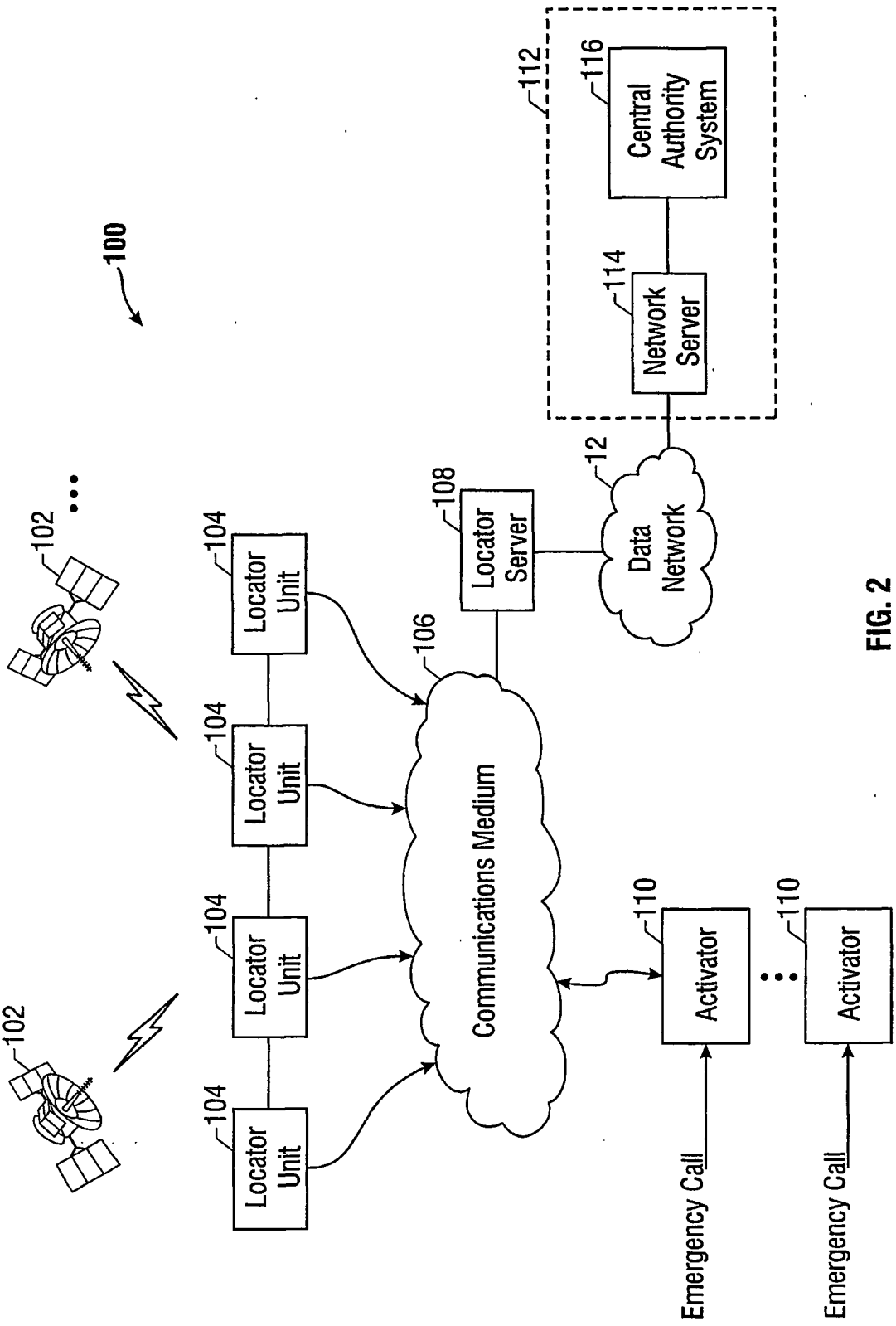
100
102
102
104
Locator Unit
104
Locator Unit
104
Locator Unit
104
Locator Unit
106
Communications Medium
108
Locator Server
12
Data Network
112
116
Central Authority System
114
Network Server
110
Activator
110
Activator
Emergency Call
Emergency Call

FIG. 2

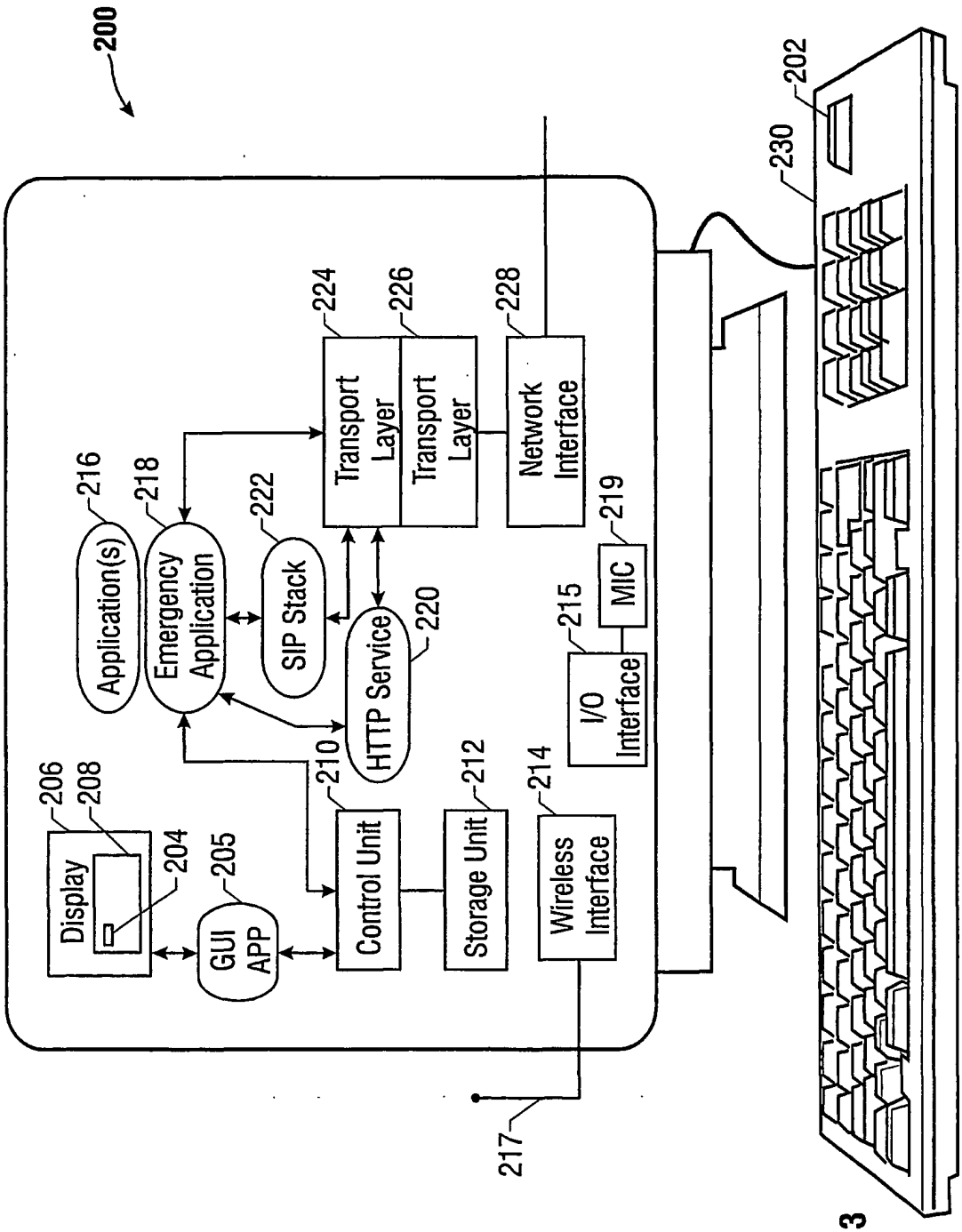
200
202
230
Application(s)
216
Emergency Application
218
SIP Stack
222
Transport Layer
224
Transport Layer
226
Network Interface
228
HTTP Service
220
MIC
219
I/O Interface
215
Display
206
208
204
GUI APP
205
Control Unit
210
Storage Unit
212
Wireless Interface
214
217

FIG. 3

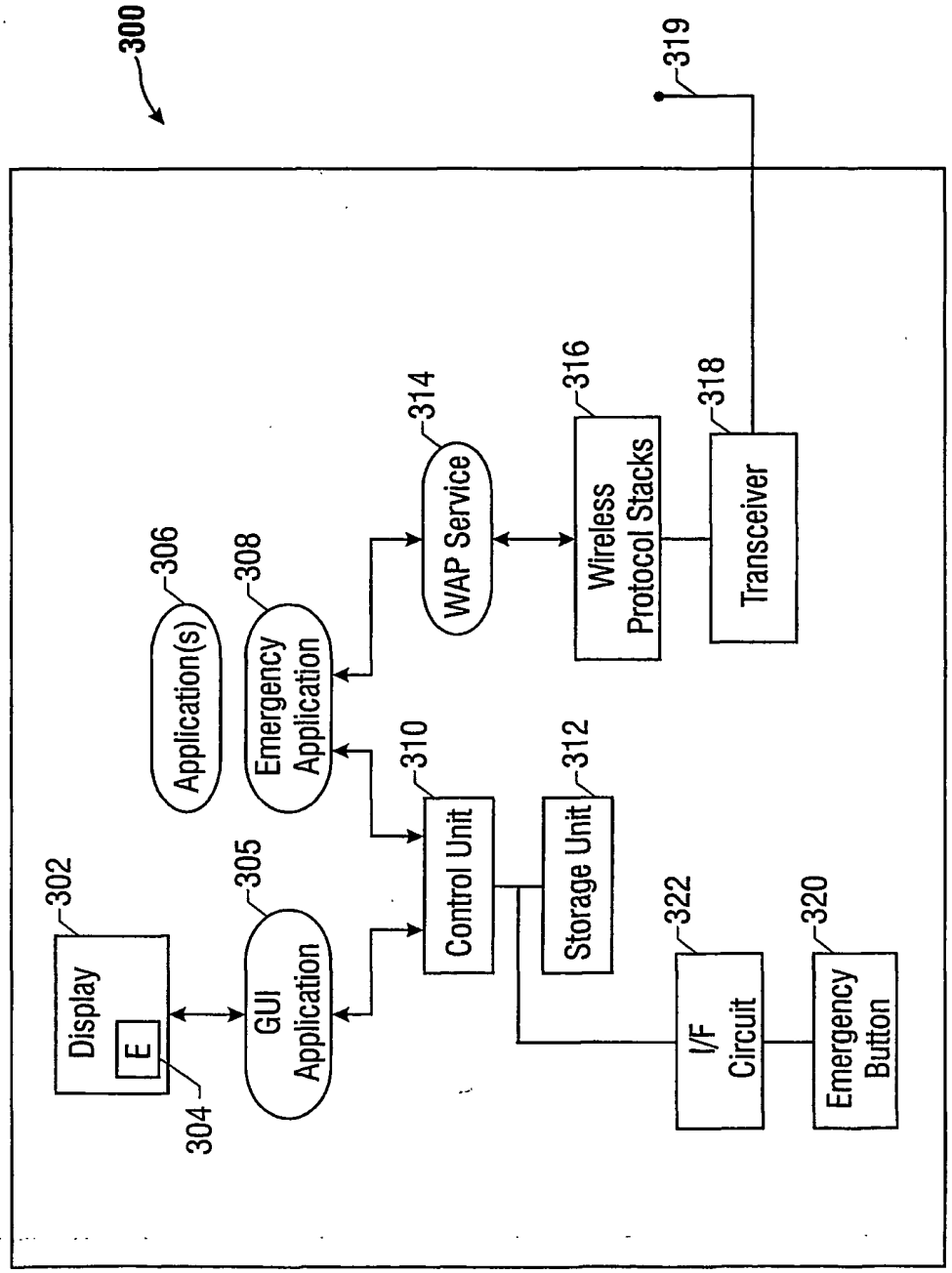
300
319
Application(s)
306
Emergency Application
308
WAP Service
314
Wireless Protocol Stacks
316
Transceiver
318
Display
302
E
304
GUI Application
305
Control Unit
310
Storage Unit
312
I/F Circuit
322
Emergency Button
320

FIG. 4

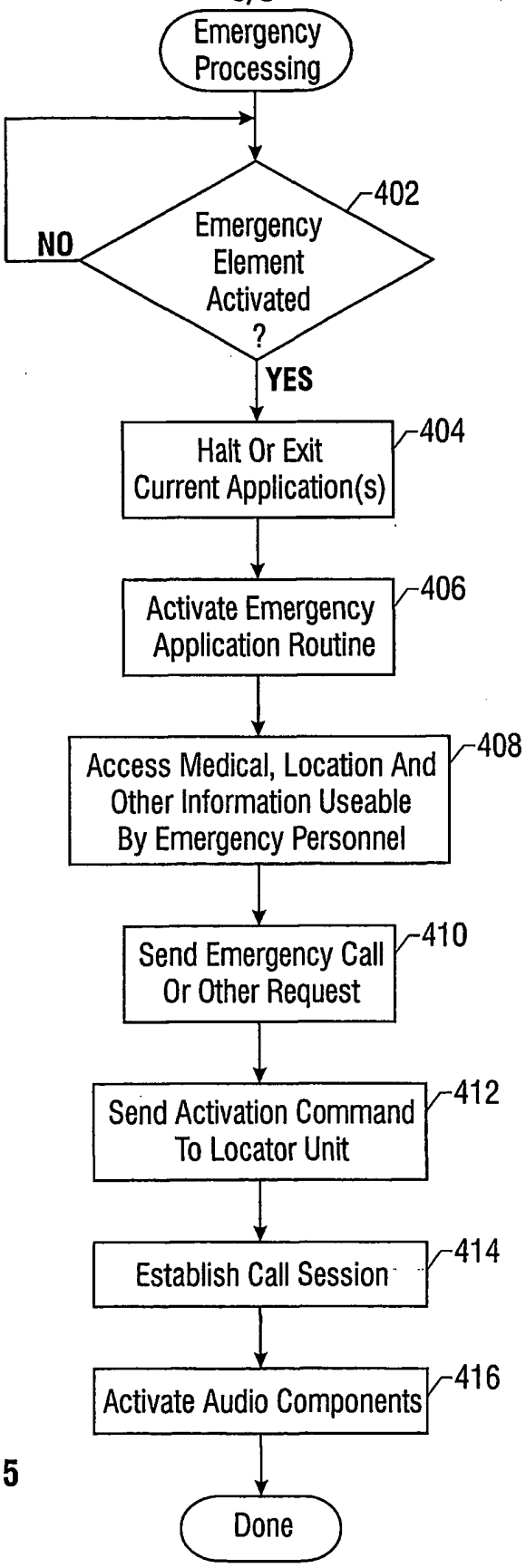
Emergency Processing
402
Emergency Element Activated ?
NO
YES
404
Halt Or Exit Current Application(s)
406
Activate Emergency Application Routine
408
Access Medical, Location And Other Information Useable By Emergency Personnel
410
Send Emergency Call Or Other Request
412
Send Activation Command To Locator Unit
414
Establish Call Session
416
Activate Audio Components
Done

FIG. 5

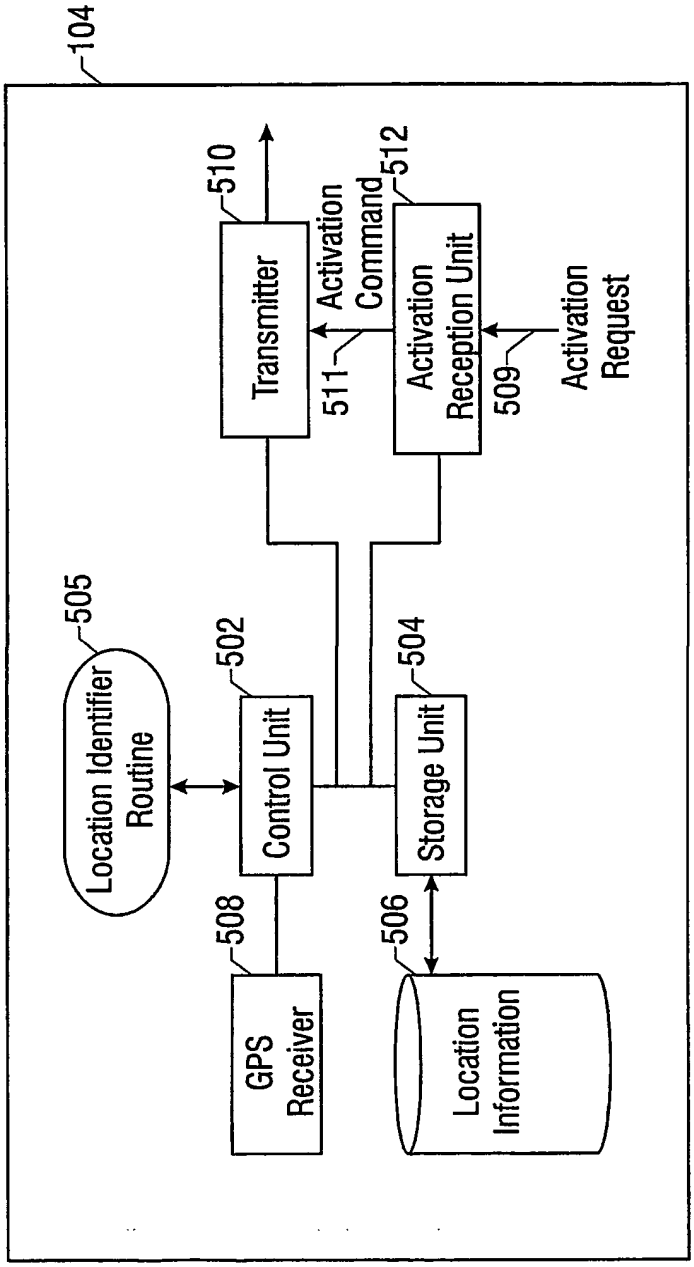
104
510
Transmitter
Activation Command
512
Activation Reception Unit
511
509
Activation Request
505
Location Identifier Routine
502
Control Unit
504
Storage Unit
508
GPS Receiver
506
Location Information

FIG. 6

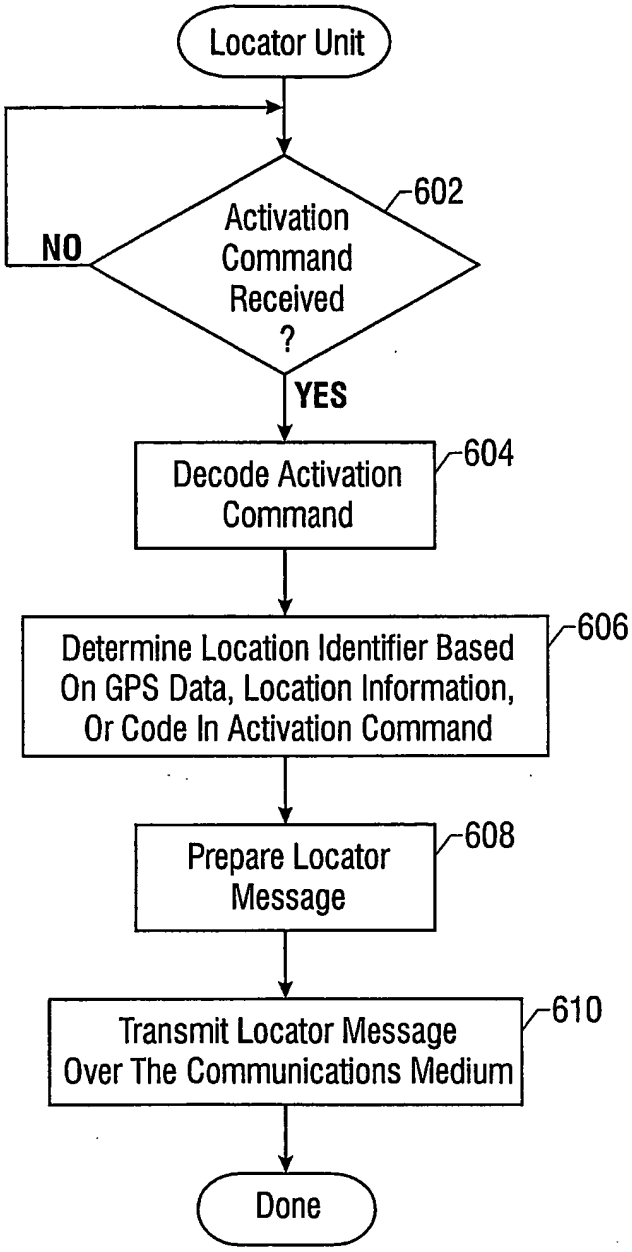
Locator Unit
602
Activation Command Received ?
NO
YES
604
Decode Activation Command
606
Determine Location Identifier Based On GPS Data, Location Information, Or Code In Activation Command
608
Prepare Locator Message
610
Transmit Locator Message Over The Communications Medium
Done

FIG. 7

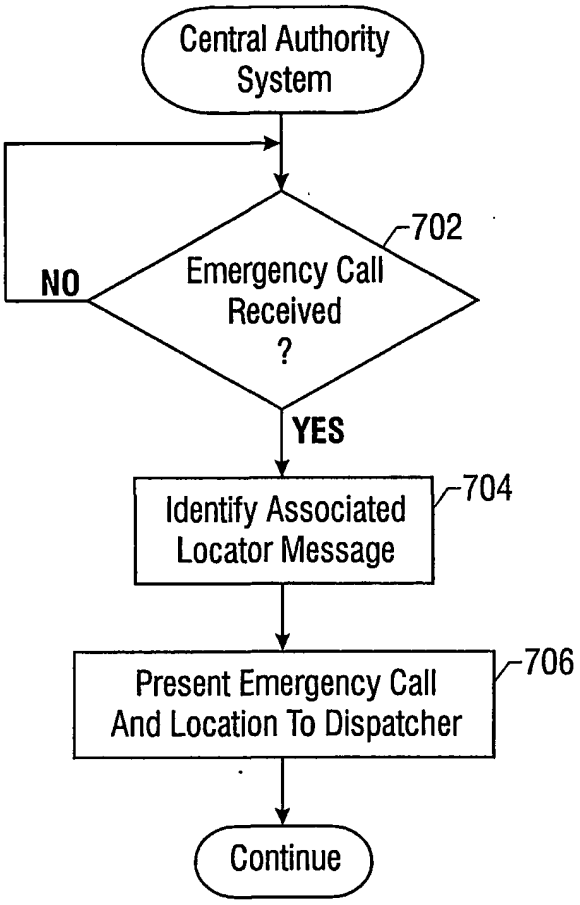
Central Authority System
702
Emergency Call Received ?
NO
YES
704
Identify Associated Locator Message
706
Present Emergency Call And Location To Dispatcher
Continue

FIG. 8